ENVIRONMENT, HEALTH & SAFETY DIVISION
Safety Engineering Group
Mail Stop 90K

INTEGRATED FUNTIONAL APPRAISAL (IFA)

Earth Sciences Division

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Executive Summary

The Environment, Health and Safety Division (EH&S) conducted an Integrated Functional Appraisal (IFA) of the Earth Sciences Division (ESD) between the months of March and May 2002. The Appraisal process involved:

- Safety walkthroughs of physical spaces linked to Activity Hazard Documents (AHDs), in addition to other administrative and laboratory venues controlled by ESD.
- Random safety-related discussions with managers and employees during the IFA walkthroughs.
- Review of Supervisor Accident Analysis Reports (SAARs), rates and trends.
- Identification of employees working > 4 hours at a computer workstation.

Participants in the IFA included technical specialists from the EH&S Division (Electrical Safety Engineer, Industrial Hygienist, Healthcare Professional/Registered Nurse (RN), and certified Ergonomist), a Department of Energy Berkeley Site Office (DOE BSO) observer, and the ESD Safety Coordinator.

The IFA helped to validate that ES&H hazards are effectively being identified, and controlled, within ESD. Continuous improvement safety measures have been initiated, and workplace injury and illnesses proactively managed.

- Top management commitment is visible and communicated by the new Division Director. Responsibility, accountability and mitigation are ongoing messages delivered and reinforced by the Division Director.
- Resources have been committed to support the ESH function by arranging a matrixed 0.50 FTE Safety Coordinator from the EH&S Division, as well obtaining the services of a new division liaison who has the technical expertise and professional certification to focus on ergonomics risks exposures within the Division.
- The Division's ISM Plan was reviewed and revised by ESD management to reflect a more tailored approach in managing ESH issues.
- There were no DOE-recordable SAAR cases during the Self Assessment performance period. The past two performance years' "increases" in the frequency and recordability of work-related injuries and illnesses were brought under control this performance year. As a result, ESD employees experienced no lost workday cases and no restricted workdays.

Opportunities for strengthening worker safety were also identified:

- During the IFA space reviews, the team encountered occasional safety issues requiring attention: housekeeping, seismic safety, chemical labeling/storage, and workstation ergonomics. Many of these findings were quickly responded to and corrected.

- Department heads, group leaders and supervisors could augment their effectiveness in EH&S administration and oversight through supplemental training (i.e., EHS 20 – EH&S for supervisors and EHS 63 – Ergonomic Awareness for Supervisors).
- Participation in periodic safety walk arounds by department heads, group leaders and supervisors would create visibility and open up dialog between employees and management. Such proactive efforts would help reinforce consistent safe work practices.

Overall, commitment to, and management of, higher hazard areas and systems that were implemented to address safety across ESD continue to be very effective.

IFA Technical Report

1.0 ESD Mission and Scope of Work

The core purpose of the Earth Sciences Division (ESD) is to create new knowledge and understanding of earth sciences in order to provide long term, large-scale innovative solutions that have broad impact on energy-related and environmental problems. The ESD consists of more than 200 full- and part-time geoscientists, mathematicians, microbiologists, computer scientists and engineers – many of who are affiliated with the University of California at Berkeley. ESD addresses local, national and global problems related to energy resources, environmental remediation, nuclear waste disposal and global change. ESD researchers collaborate with scientists across the nation and around the world, seeking to develop ties and enhance synergy among scientists, disciplines and institutions.

2.0 Introduction: IFA Scope and Objectives

The Integrated Functional Appraisal (IFA) is a key component of Berkeley Lab's Integrated Safety Management (ISM) system. It is part of Core Function #5 (Continuous Improvement) of the ISM concept and forms one of the three tiers of the Laboratory's Self-Assessment Program. The role of the IFA is to provide a technical "occupational safety and health" review of the Directorate to assure workplace safety programs are providing adequate protection, as well as identify opportunities for continuous improvement. The objective of each triennial IFA is to evaluate the ongoing effectiveness of Divisions' Integrated Safety Management Programs. The EH&S Division is charged with the responsibility to coordinate and perform the IFA. The last IFA conducted for the Directorate's Organizational Units occurred in 1998.

3.0 IFA Process and Procedures

The IFA initially focused on examining work areas under the auspices of a formal authorization (i.e., Activity Hazard Documents [AHDs], RWAs, SSAs, etc.). Since all ESD-issued AHDs are currently in an "inactive status", a risk-based approach was utilized to identify a representative sample of physical spaces having potentially higher hazard levels. Final selection of venues for the IFA relied upon the review of the following documentation and data:

- Scope of work performed by the various ESD departments:
    - Hydrogeology and Reservoir Dynamics
    - Geochemistry
    - Geophysics and Geomechanics
    - Administrative and Technical Assistance
    - Microbial Ecology and Environmental Engineering

- Supervisor Accident Analysis Reports of injuries and illnesses sustained by employees working in the Directorate's Organizational Units
- Self Assessment Report findings
- 1998 IFA Report
- Hazard information from the Integrated Hazards Assessment (IHA) database (superceded by the Hazard, Equipment, Authorization and Review [HEAR] database system)
- Ergonomic Evaluation Reports
- Any formal work authorizations associated with RWAs, RWPs, SSAs, SWAAs, PHAs, SADs/FSADs, Discharge permits (sewer/air), and NEPA/CEQA documents, etc.
- Areas where students are assigned to work.
- Activity Hazard Documents (AHDs) issued to ESD. Although all of the ESD AHDs are currently inactive, priority was still given to review these spaces (refer to Appendix 2: ESD Activity Hazard Document Listings)

The finalized list of locations identified for IFA walkthroughs along with the responsible manager are listed below in Table 1. The results of the IFA walkthroughs are documented in detail within the table found in Appendix 1.

4.0 Review of Worker Injuries and Illnesses

Another area of focus for the IFA involved the review of workplace injuries and illnesses and the impact of accident prevention efforts over the course of the Self-Assessment period. Injury and illness data were collected and tabulated from the SAAR database for the period of July 1, 1999 through June 30, 2002. There was an upward trend in recordable cases experienced in the prior two consecutive performance years.

ESD management took an active role in attempting to manage this uptick by making arrangements with the EH&S Division to assign a 0.50 FTE matrixed employee to help develop and coordinate the internal ESH programs. Another strategic move was the assignment of a new EH&S Division Liaison who had the expertise to address the ergonomic factors contributing to most recordable injuries and illnesses occurring to division employees.

Table 1: IFA Walkthrough Locations

Earth Sciences Division	Department Head/ Line Manager	Locations	
Hydrology and Reservoir Dynamics	Chin-Fu Tsang	**51**-007 **70**-114 **70**-116	**70**-127 **70**-131 **70**-143
Geochemistry	Don DePaolo	**70A-**4403 **70A**-4405 **70A-**4413 **70A-**4419 **70A-**4421 **70A-**4425	**70A-**4425A **70A-**4429 **70A-**4431 **70A**-108 **70A**-158 **70A**-168
Geophysics and Geomechanics	Ernie Majer	**51F**101 **51F**-Exterior Space	**51F**-102
Administrative/Division Offices	Linda Wuy	**90**-1078 **90**-1094 **90-**1106 **90**-1108	**90-**1110 **90**-1114 **90**-1116
Technical Support	Norm Goldstein	**64**-160 **64**-160A **64**-160B	**64**-161 **64**-163
Microbial Ecology & Environmental Engineering	Terry Hazen	**70A**-2275 **70A**-4459 **70A**-4461 **70A**-4462 **70A**-4463A	**70A**-4463B **70A**-4473 **70A**-4475 **70**-173 **70**-173 Mezzanine

A proactive accident prevention strategy was developed between the ESD Safety Coordinator and the EH&S Liaison. The plan was shared with the ESD Safety Committee and endorsed. The strategy involved a progressive ergonomics intervention program consisting of:

- Increasing ergonomics awareness training (EHS 060 Course)
- Preventive Ergonomic Evaluations (priority given computer users with > 4 hours of exposure ~ 50% of the employees have been evaluated)
- Thorough SAAR investigations, timely corrective actions and issuance of lessons learned
- Ergonomic workstation reconfigurations
- Consultation to encourage and reinforce safe ergonomic practices/behaviors

Appendix 3 depicts the process flow to progressively address ergonomics and accident prevention within the division.

The key goals and objectives of this accident prevention program were to:

- Enhance ergonomics awareness/knowledge.

  (Results: 96% of the ESD staff has completed EH&S 60 course)

- Identification and early intervention of at-risk ergonomic conditions and practices/behaviors.

  (Results: over 50% contact rate with ESD staff that included formal ergonomic evaluations and/or informal phone to field consultations)

- Reduction in the number of DOE recordable SAARs and TRC/LWC rates.

  (Results: Past two performance years' "up ticks" in the frequency and DOE-recordability of work-related injuries and illnesses was brought under control this performance year. There have been **zero** (0) DOE-recordable cases experienced by the Division, as well as **zero** (0) lost and **zero** (0) restricted work days. (See accident data table below and in Appendix 4)

Earth Sciences Division	7/1/99 – 6/30/00	7/1/00 – 6/30/01	7/1/01 – 6/30/02
Total SAARS	**6**	**10**	**7**
Recordable Cases	**5 (83%)**	**7 (70%)**	**0 (0%)**
TRC Rate	**4.17**	**5.89**	**0.00**
First Aid Cases	**0 (0%)**	**2 (30%)**	**5 (71%)**
Non-Industrial	**1 (7%)**	**0 (0%)**	**2 (29%)**
Lost Days	**133**	**8**	**0**
Restricted Work Days	**105**	**0**	**0**
Total Recordable Case Rate (TRC)	**4.17**	**5.89**	**0.00**

5.0 IFA Results and Recommendations

In general, physical space under the control and use of ESD were well maintained, indicating strong commitment to ES&H by management and staff, as well as the effectiveness of the division's self-assessment program. The at-a-glance performance ratings also support this conclusion. During the IFA space reviews, the team encountered occasional safety issues requiring attention: housekeeping, seismic safety, chemical labeling/storage, and workstation ergonomics. Many of these findings were quickly responded to and corrected either on the spot or within a few days.

Noteworthy Practices/Initiatives

- Top management commitment is visible and communicated by the new Division Director. Responsibility, accountability and mitigation are ongoing messages delivered and reinforced by the Division Director.
- The institutional HEAR database is being proactively used to help the division organize, document and inventory current hazard and equipment within ESD occupied and controlled spaces.
- Resources have been committed to support the ESH function by arranging a matrixed 0.50 FTE Safety Coordinator from the EH&S Division, as well obtaining the services of a new division liaison who has the technical expertise and professional certification to focus on ergonomics risks exposures within the Division.
- The Division's ISM Plan was reviewed and revised by ESD management to reflect a more tailored approach in managing ESH issues.
- Past two performance years' ""up ticks"" in the frequency and DOE-recordability of work-related injuries and illnesses was brought under control this performance year. There have been no/zero (0) DOE-recordable cases experienced by the Division, as well as zero (0) lost and zero (0) restricted work days.
- The Division's support and implementation of a proactive accident prevention program to address DOE-recordable cases and ergonomic root causes reflects a genuine and ongoing commitment to worker safety and health.
- Student safety receives equal in priority as to employee safety. Students are managed with the same level of orientation, training and oversight as other ESD personnel.
- Line managers are responsive to employee safety needs by correcting hazards brought to their attention, equipping offices for safety and installing ergonomic accessories or reconfiguring at-risk computer workstations.

- Effectively investigating and managing SAARs: none of them resulting in further aggravation of injury or recurrence.

Opportunities for Continuous Improvement

- Participation in periodic safety walk arounds by department heads, group leaders and supervisors would create visibility and open up dialog between employees and management. Such proactive efforts would help reinforce consistent safe work practices.
- Department heads, group leaders and supervisor could augment their effectiveness in EH&S administration and oversight through stronger ownership and supplemental training (i.e., EHS 20 – EH&S for supervisors and EHS 63 – Ergonomic Awareness for Supervisors).
- The ESD organizational chart in its website needs to be updated to reflect the current level of reporting for the ES&H function and program coordinator. This will further reinforce the level of ESH importance, commitment and support to the overall ESD mission.
- ESD Safety Committee could enhance its effectiveness by creating little more structure at its meetings. This can be accomplished by developing a standardized agenda revisit open action items, set timeframes for topical discussions and a special line item to report on and address safety priorities of the Division Director. Consideration should be given to add more details into the description and purpose of the committee in the ESD ISM plan. This will help to further clarify the role and responsibilities of the committee to be in alignment with the safety vision of the Division Director.
- Continue the proactive ergonomics accident prevention program to help sustain the improvements experienced to date.

Overall, commitment to, and management of, higher hazard areas and systems that were implemented to address safety across ESD continue to be very effective.

Jeffrey Chung Date

IFA Team Lead

APPENDIX 1

ESD IFA Inspection Findings and Recommendations

Item #	Bldg	Room	Finding	Action
64-01 *16 Items Total*	64	160A	Four computer workstations (2 offices) not ergonomically configured.	If computer use is > four (hours), please request an ergonomic evaluation by contacting Jeffrey Chung at x5818 (JYChung@lbl.gov). Assure employees complete EH&S 060 training if they meet the use criterion. **PENDING**
64-02 *16 Items Total*	64	160A	Several storage cabinets have equipment and binders placed on top of them. Many are located adjacent/within employee working areas, creating a potential seismic hazard.	Reduce overhead seismic hazards from falling objects by relocating such items or installing seismic lips/restraints. **DONE**
64-03 *16 Items Total*	64	160A	Bookcase adjacent to the exit door (opposite high bay) has a 72-inch tall bookcase full of binders, but without seismic restraint (chains or bungee cords to restrain items from dislodging during an earthquake)	Install seismic restraints across each bookcase shelf. **DONE**
64-04 *16 Items Total*	64	160A	Soldering activities occur on the workbench, but no fire extinguisher was found in the room. The room, however, is sprinklered.	EH&S Fire Prevention Engineer (Rob Campbell – x6370) will be reviewing extinguisher placement in this room and surrounding areas to determine need for a fire extinguisher within 75' travel distance. He will provide feedback and recommendations.
64-05 *16 Items Total*	64	160A	The workbench contained various cables may channeling fluids/water through them.	The EH&S Electrical Safety Engineer expressed some concerns about potential electrical conductivity hazards created by fluid/water movement through these hoses. Please consult with Tom Caronna (x4314).
64-6 *16 Items Total*	64	161 Machine Shop	Several electrical safety issues were observed along the west wall: ▪ Two (2) electrical panel are obstructed ▪ Two (2) electrical panels were locked out with one not having the proper tag out attached to it, violating safety procedures for lock out/tag out. ▪ Two (2) electrical power disconnects were obstructed	Remove obstructions that are impeding access to these electrical circuit breaker panels and disconnects. Maintain a minimum of 36 inches of unobstructed clearance in front of each electrical panel. Properly label panels that are locked out by following the Lockout/Tag Out procedures in Pub 3000, Chapter 18. Consult with the EH&S Electrical Safety Engineer for more guidance (Tom Caronna – x4314). As of 5/1/02, the shop personnel have cleared all space in front of electrical panels. **DONE**
64-7 *16 Items Total*	64	161 Machine Shop	One (1) electrical power disconnect has a band saw blade stored/hanging around it.	Remove blade obstructing disconnect.

Item #	Bldg	Room	Finding	Action
64-8 *16 Items Total*	64	161 Machine Shop	The freestanding drill press (#DP 11) is not seismically anchored to the floor.	Correct by submitting work request to Facilities at x6274. Note: As of 5/1/02, shop personnel took the extra step to self-identify and fix the stress relief of cord on drill press.
64-9 *16 Items Total*	64	161 Machine Shop	Wear Eye Protection warning decals/signs were not visible on all shop machines.	Assure safety warnings, i.e., "Caution – Wear Eye Protection" decals are visibly place on shop machines.
64-10 *16 Items Total*	64	161 Machine Shop	Delta grinder (#1298) is missing a guard, tool rest and light fixture is not secured and dangling from its electrical cord.	Make necessary repairs. The machine has been tagged out of service until repairs are made. As of 5/1/02, shop personnel have reattached the guards, tool rests, and lights to the grinder. **DONE**
64-11 *16 Items Total*	64	161 Machine Shop	Local exhaust ventilation system (elephant trunks) to various shop machines do not have indications of IH Group testing and certification.	Contact IH Group (John Seabury – x 6547) to schedule system review and certification. As of 5/1/02, the tool ventilation system was certified at all points of use. **DONE**
64-12 *16 Items Total*	64	161 Machine Shop	Guards over the fluorescent light fixtures are missing or not secured properly.	Acquire and/or secure guard for fluorescent light fixtures above where shop machines are being operated. **DONE**
64-13 *16 Items Total*	64	163 High Bay	There is impeded access to four (4) electrical panels that area block by equipment. Three (3) are located along the east wall and one (1) is along the west wall.	Remove obstructions to maintain a minimum of 36 inches of unobstructed clearance in front of each electrical panel. **DONE**
64-14 *16 Items Total*	64	163 High Bay	Some freestanding lockers and storage cabinets were found near the east wall.	Seismically secure/anchor freestanding lockers and storage cabinets. **DONE**
64-15 *16 Items Total*	64	163 High Bay	A large steel plate placed on the high bay floor within 18 inches from the base of the adjacent metal access ladder/stairway to the mezzanine may pose an unsuspected trip hazard.	Relocate steel plate away from the access path to the metal ladder/stairway. **DONE**
64-16 *16 Items Total*	64	163 High Bay	Three orange color batteries on the workbench (adjacent to acetylene welding unit) have exposes + and – terminals.	Insulate the + terminal on each battery. **DONE**

Item #	Bldg	Room	Finding	Action
51-01 *2 Items Total*	51	007	A fire extinguisher was found on the floor next to the exterior entrance into the lab.	Mount the fire extinguisher onto the wall. **DONE**
51-023 *2 Items Total*	51	007	A chronic water leak problem, usually occurring on during rainy days, was reported by the room occupants. The water enters from the ceiling and pools onto the floor below the electrical panel that is located next to the interior exit doors. A make shift berm has been installed on the floor to contain the water. The berm creates and obstruction to the electrical panel.	The berm needs to be removed or reconfigured. Please contact EH&S Electrical Safety Engineer Tom Caronna – x4314. **DONE**
51F-01 *13 Items Total*	51F	102 X-Ray Room	The non-operational linear X-ray machine currently does not have an interlock device installed. The scientist is still awaiting issuance of a use authorization.	The ESD ESH Coordinator will contact Ted De Castro to determine the status of his authorization review for this X-ray unit.
51F-02 *13 Items Total*	51F	102 X-Ray Room	The overhead electrical cables for the linear X-ray machine are secured and supported by “bungee” cords. These cords will eventually fatigue and break and are not appropriate devices.	Install unistrut cable trays to support the overhead electrical cords and cables.
51F-03 *13 Items Total*	51F	102 X-Ray Room	The linear X-ray machine is missing its guard to protect the around the mechanical belt.	Replace the missing guard before the X-ray machine becomes operational.
51F-04 *13 Items Total*	51F	102 X-Ray Room	The electrical circuit breaker panel has an outdated panel schedule mounted on its exterior door. It does not accurately depict panel contents.	Contact Facilities Department Work Request Center to request the electricians to come and update the official panel schedule. **DONE**
51F-05 *13 Items Total*	51F	102 X-Ray Room	Several chemical flasks and bottles on a worktable were not labeled.	Label all chemical flasks and bottles containing solutions/product.
51F-06 *13 Items Total*	51F	102 X-Ray Room	Freestanding core samples were stored next to and above chemical-containing bottles and flasks. Falling core samples could easily fall and break the glass flasks and bottles.	Physically separate and store core samples away from chemical-containing bottles and flasks.

Item #	Bldg	Room	Finding	Action
51F-07 *13 Items Total*	51F	102 X-Ray Room	Chevron employees periodically utilize the room and the Soma tom H.Q. CAT Scan.	Please reinforce the safety reminder that the electrical panel labeled "Omega" must be locked out and not to be opened to work on when energized. Lockout/tag out procedures must be followed when accessing the panel.
51F-08 *13 Items Total*	51F	102 X-Ray Room	Two organic vapor respirators with HEPA filter attachments were stored openly on the workbench. Chevron employees use the respirators when they use toluene to clean the core holder of the CAT scan unit.	The respirators need to be placed in "zip lock" bags for proper respiratory maintenance and storage. It should also be verified whether or not the Chevron employees are monitored under the OSHA Respiratory Protection Program.
51F-09 *13 Items Total*	51F	103 Control Room	An electrical panel in the back of the room (adjacent to Super conducting magnet) was obstructed.	Remove obstructions that impede access to the electrical panel. **DONE**
51F-10 *13 Items Total*	51F	103 Control Room	There was no information on the Super-conducting magnet (located near the occupied control panel workstation) to indicate the relative strength of the magnetic fields.	Contact Ted De Castro at x5256 for non-ionizing radiation safety issues. He will take gauss readings. **DONE**
51F-11 *13 Items Total*	51F	103 Control Room	The workbench is quite cluttered with tools, parts, storage, etc.	Improve housekeeping on the Benchtop. **DONE**
51F-12 *13 Items Total*	51F	Exterior	Haphazard storage is occurring outside of 51F creating access and potential trip hazards. Pallets, rock cutting equipment, plastic 55-gallon drums, pumps, compressed gas cylinders, bags of sand, etc. are randomly placed on the ground. Apparently some of the items belong to others in the division, as well as to the Facilities Department..	Mac Kennedy needs to dispose of two small gas freestanding gas cylinders. The Facilities Department needs to be contacted (via the Work Request Center) to remove their surplus materials. Please contact John Seabury to review cryogenics issues. **DONE**
51F-13 *13 Items Total*	51F	Exterior Outside Room 103	Soiled waste rags were found stored in a cardboard box. These items were place there by Chevron employees.	The waste rags need to be placed in a metal container. **DONE**
70A-01 *23 Items Total*	70A	2275	A Radiation Clearance Tag, dated 1993 is still taped onto surface of the DEXON unit.	Determine if tag is necessary to remain; otherwise remove.

Item #	Bldg	Room	Finding	Action
70A-02 *23 Items Total*	70A	2275	Duct tape is being used to bundle electrical cords above the lab bench.	Replace duct tape with plastic zip cable ties.
70A-03 *23 Items Total*	70A	4403	Electrical panel was obstructed.	Maintain a minimum of 36 inches of unobstructed clearance in front of each electrical panel. **DONE**
70A-04 *23 Items Total*	70A	4403	Heavy glass doors are being stored above the wall mounted storage cabinets (opposite wall of the titration apparatus) and they extend beyond the protective lip designed to contain them.	Contact Facilities Department Work Request Center to remove the heavy glass doors that can fall from overhead during an earthquake.
70A-05 *23 Items Total*	70A	4403	Cabinets obstruct the emergency light fixture located above the wall-mounted storage cabinets.	Contact Facilities Department Work Request Center to have the electricians remove and reinstall the emergency light fixture in a functional location. Item has been corrected by the Facilities Department. **DONE**
70A-06 *23 Items Total*	70A	4405 Clean Room	Hazardous waste materials are being generated and stored next to the Mass Spectrometer.	Establish area as a Satellite Accumulation Area (SAA). Use red waste label on carboy. Need to resolve uranium waste issue in the Clean Room.
70A-07 *23 Items Total*	70A	4405 Clean Room	The Mass Spectrometer exhaust ventilation system is not included in the EH&S Industrial Hygiene Group database.	Contact EH&S Industrial Hygiene Group, John Seabury (x6547), to include exhaust system into the IH database.
70A-08 *23 Items Total*	70A	4405	Flattened cardboard boxes are stored on the floor under the emergency shower/eye wash unit.	Remove cardboard from obstructing access to emergency shower/eye wash.
70A-09 *23 Items Total*	70A	4419	A small gas cylinder containing methyl chloride was laying on its side and against a gas regulator.	Relocate gas cylinder away from regulator.
70A-10 *23 Items Total*	70A	4419	There is an unlabeled squeeze bottle found at the sink containing some unknown liquid.	Identify content and label squeeze bottle.
70A-11 *23 Items Total*	70A	4419	There is an unlabeled chemical bottle found in the fume hood containing some unknown liquid.	Identify content and label chemical bottle.

Item #	Bldg	Room	Finding	Action
70A-12 *23 Items Total*	70A	4419	The refrigerator is not seismically anchored.	Submit request through the Facilities "Work Request Center" to secure the refrigerator.
70A-13 *23 Items Total*	70A	4419	A CO_2 fire extinguisher was found on the floor.	Mount extinguisher on wall next to refrigerator.
70A-14 *23 Items Total*	70A	4419	An older electrical circuit breaker panel on the left wall (facing lab doors toward corridor) does not have the proper access/clearance.	Determine if panel is energized through Tom Caronna, Electrical Safety Engineer. (x4314).
70A-15 *23 Items Total*	70A	4419	Wooden pallets adjacent to the electrical shut-off switch is obstructing access. Plastic sheet is covering the switch.	Remove pallets obstructing access to the shut-off switch. Remove plastic sheet over shut-off switch.
70A-16 *23 Items Total*	70A	4419	Low activity radioactive materials are stored in the lab.	Determine if a "Controlled Area" radioactive materials sign is needed on the door. Contact Chris Donahue, Radiation Protection Group (x7736).
70A-17 *23 Items Total*	70A	4421 Mass Spec. Room	A high intensity lamp is on and left unattended on the bench top next to some plastic squeeze bottles labeled as "flammable liquids".	Remove squeeze bottles containing flammable liquids away from the hot lamp. **DONE**
70A-18 *23 Items Total*	70A	4463	Some chemical containers housed in the Flammable Storage Cabinet have not been included in the Chemical Inventory database. They are missing the Lab's barcode.	Install barcodes onto chemical containers and input into Chemical Inventory database. **DONE**
70A-19 *23 Items Total*	70A	4463	Freestanding storage case that's wedged between the wall (adjacent to emergency eyewash and shower) could fall over and block egress.	Seismically secure free-standing storage case. **DONE**
70A-20 *23 Items Total*	70A	4463	Free-standing refrigerator is not seismically secured.	Seismically anchor refrigerator. **DONE**
70A-21 *23 Items Total*	70A	4463A	Boxes on top of wall-mounted cabinets are very close to emergency lights and could block this illumination source during power outage.	Relocate boxes away from emergency light fixture. **DONE**

Item #	Bldg	Room	Finding	Action
70A-22 *23 Items Total*	70A	4463A	The UV light fixture (currently not in use) in the adjacent room [LSD Lab space for Hoi-Ying Holman] could be seen through the window in the door.	Window should be shielded when UV light becomes operational.
70A-23 *23 Items Total*	70A	4463C	Wall-mounted storage cabinets (outside of 4463C) used for storing chemical glassware were left open.	For seismic safety purposes, keep sliding doors closed to contain chemical glassware. **DONE**
70-01 *47 Items Total*	70	108 EML	A cart blocked the circuit breaker panel.	Maintain a minimum of 36 inches of unobstructed clearance in front of each electrical panel. **DONE**
70-02 *47 Items Total*	70	108 EML	The freestanding refrigerator was not seismically braced.	Anchor the lab refrigerator for seismic safety. Correct by submitting work request to Facilities at x6274. **DONE**
70-03 *47 Items Total*	70	108 Environ. Meas. Lab	Chains across bookcase shelving used to seismically restrain binders were not being used.	Resecure chains and/or install chains (bookcase at entrance to lab) **DONE**
70-04 *47 Items Total*	70	114	Egress from the lab is obstructed by various items: spill kit (absorbent) materials, plastic buckets, waste receptacle and ladder.	Relocate items away from exit door. **DONE**
70-05 *52 Items Total*	70	114	The drill press and grinder housed on the cart does not have an “anti-restart protection switch.”	Install “anti-start protection switch”. Contact EH&S Electrical Safety Engineer, Tom Caronna (x4314) for guidance/assistance. **DONE**
70-06 *47Items Total*	70	114	Sieve containers are being stored overhead without seismic restraint.	Seismically contain sieves or relocate. **DONE**
70-07 *47 Items Total*	70	114	Electrical panel is obstructed by boxes.	Maintain a minimum of 36 inches of unobstructed clearance in front of each electrical panel. **DONE**
70-08 *47 Items Total*	70	116	Waste receptacle is placed under the emergency shower, blocking its access and use.	Relocate trashcan away from emergency shower. **DONE**

Item #	Bldg	Room	Finding	Action
70-09 *47 Items Total*	70	116	Exposed electrical wires were observed coming out from the ceiling conduit (above emergency shower).	Contact Facilities Department Work Request Center to have the electricians remove the exposed wiring. **DONE** (wires are out of service)
70-10 *47 Items Total*	70	116	Chemical bottles/flasks were placed on the lab bench without secondary containment.	Provide secondary containment for chemical glassware. **DONE**
70-11 *47 Items Total*	70	120	A metal storage rack "Norelco" is obstructing the required clearance in front of the circuit breaker panel.	Relocate metal storage rack to maintain at least 36 inches of unobstructed access to the electrical panel.
70-12 *47 Items Total*	70	120	A couple of small electrical transformers stored on the Benchtop do not have proper protective shielding.	Install shielding for the two transformers. Contact Tom Caronna, EH&S Electrical Safety Engineer for guidance (x4314).
70-13 *47 Items Total*	70	120	A freestanding computer monitor is being stored on a shelf above the computer workstation.	Install seismic lip across the open shelf or relocate computer monitor.
70-14 *47 Items Total*	70	120	Refrigerator used for chemical storage contains a beverage can (Coke) in it.	So not store/commingle food items in a refrigerator used to store hazardous chemicals. Label refrigerator with proper warning sign.
70-15 *47 Items Total*	70	120-	Individual chemical bottles containing acid are being stored in the fume hood.	Secondary containment is needed for the acids in the hood.
70-16 *47 Items Total*	70	120	Several sharp-edge metal cable trays are being stored adjacent to the fume hood and could fall over onto a users at the fume hood.	Relocate metal cable tray storage away from fume hood and work areas.
70-17 *47 Items Total*	70	120	A freestanding 5-drawer vertical file cabinet is located within an occupied area.	Seismically anchor the file cabinet.
70-18 *47 Items Total*	70	131	There is a free-standing Laser Writer printer next to the exit door.	Install "quake grip" Velcro material to seismically restrain the printer.

Item #	Bldg	Room	Finding	Action
70-19 *47 Items Total*	70	131	The free-standing glove box is not seismically anchored.	Seismically anchor the glove box.
70-20 *47 Items Total*	70	131	The SAA is placed at the emergency eyewash.	Relocate SAA away from emergency eyewash.
70-21 *47 Items Total*	70	131	Duct tape is used to secure plywood board located above the sink.	Secure with screws, not duct tape.
70-22 *47 Items Total*	70	131	Tape is being used to cover electrical outlets. This approach can trap moisture and create an electrical hazard	Replace tape over the receptacles with “child-proof” caps.
70-23 *47 Items Total*	70	131	The T. Brinkman 2540M Autoclave is not seismically constrained.	Reinstall missing seismic restraint.
70-24 *47 Items Total*	70	131	Chemical bottle containing an “amber liquid” is not labeled.	Label chemical container.
70-25 *47 Items Total*	70	131	Duct tape is being used to support excess electrical cable connected to the center lab bench plug strip.	Replace duct tape by installing a hook and coiling the cord.
70-26 *47 Items Total*	70	131	Plug mold strip, stored on a shelf (next to reference book cabinet), has exposed wiring (open box) and is improperly assembled (ground interrupted).	The plug mold strip is to be placed “OUT OF SERVICE” until corrected. Contact EH&S Electrical Safety Engineer, Tom Caronna (x4314) for guidance/assistance.
70-27 *47 Items Total*	70	143	An electrical cord is strewn across the electrical panel that powers the adjacent “Blue M Oven”.	Permanent wiring should be installed to supply electrical power to the oven.
70-28 *47 Items Total*	70	143	A wood shelf is found leaning adjacent to the back of the Blue M Oven, creating a source of combustible material.	Remove wooden shelf.

Item #	Bldg	Room	Finding	Action
70-29 *47 Items Total*	70	143	Compressed gas cylinder rack: the chains do not directly secure the cylinders (very loose chains).	Properly secure the cylinder with its seismic restraint chain.
70-30 *47 Items Total*	70	143	A long phone cord is stretched across from the wall, across the floor and to a desk. This creates a potential trip hazard.	Secure phone cord with tape or retract phone cord when not in use.
70-31 *47 Items Total*	70	143	An oven and cart containing sand/water column need wheel chocks.	Install wheel chocks to keep oven and carts stationary.
70-32 *47 Items Total*	70	143	Several asbestos-containing floor tiles next to the incubators are broken.	The asbestos containing floor tiles need to be sealed.
70-33 *47 Items Total*	70	143	There is considerable storage on the Loft that may pose a seismic hazard.	Remove and/or seismically contain storage on loft.
70-34 *47 Items Total*	70	143	An exit sign is mounted on door leading into Robert Cheng's Lab B70-141.	Remove exit sign that directs egress into another lab.
70-35 *47 Items Total*	70	143	A hand-written exit sign is mounted on the door to the "Ante Room."	Replace hand written exit sign with an appropriate one.
70-36 *47 Items Total*	70	158	The various refrigerators in the lab are not seismically retrained.	Seismically anchor the various refrigerators in the lab. Correct by submitting work request to Facilities at extension 6274.
70-37 *47 Items Total*	70	158	Not all of the group of one (1) gallon glass bottles on a lab bench containing liquids were labeled. A few of the bottles were labeled as containing de-ionized water.	Label all chemical containers. **DONE**
70-38 *47 Items Total*	70	158	The computer workstation in the lab is not ergonomically configured.	Please contact Jeffrey Chung – x5818 for an ergonomic evaluation. If the lab employee works > four (4) hours/day on the computer, the workstation may need additional ergonomic accessories. **PENDING**

Item #	Bldg	Room	Finding	Action
70-39 *47 Items Total*	70	158	Some exposed electrical wires were observed behind one of the lab refrigerators located next to Kendra's desk and the exit door.	The electrical wires need to be capped. **DONE** (wires taken out of service)
70-40 *47 Items Total*	70	158	There is an electrical hot plate located on a cart (next to IGC Centrifuge) that has exposed electrical wires from the electrical cord.	The hot plate needs to be place out of service until the electrical cord is repaired or replaced.
70-41 *47 Items Total*	70	166 EML	The computer workstation in the lab is not ergonomically configured. The lab employee indicates that she works four or more hours/day on the computer.	An ergonomic evaluation is needed for the employee working at this computer desk. Please contact Jeffrey Chung – x5818 to schedule. **PENDING**
70-42 *47 Items Total*	70	166 EML	A freestanding refrigerator is placed on top of the lab bench across from the Perkin-Elmer GC.	Seismically secured or relocate to the floor. **DONE**
70-43 *47 Items Total*	70	173	Black 72-inch bookcase (next to Beckman Centrifuge) did not have seismic restraints/chains to contain its content.	Install chains, bungee cord or other seismic restraints along each bookcase shelf.
70-44 *47 Items Total*	70	173	The canopy hood used for MTBE study needs to be tested.	Contact the EH&S Industrial Hygiene Group (John Seabury – x6547) for hood testing and certification. **DONE**
70-45 *47 Items Total*	70	173	The back panel of the "BioFlo Bioreader" equipment left open, exposing energized electrical components.	Keep the panel closed. For safety from electrical shock, a shield needs to be installed to protect the worker from the exposed capacitor. Please contact EH&S Electrical Safety Engineer, Tom Caronna – x4314, for further guidance.
70-46 *47 Items Total*	70	279	Light switch is not protected from water contact whenever the adjacent to emergency shower and eyewash is activated.	Install plastic weather proof (PVC) cover for light switch.
70-47 *47 Items Total*	70	279	Compressed gas cylinders are stored in racks, but have been out of service for some time.	Replace regulators with cylinder caps and remove.
90-08 *22 Items Total*	90	2002B	Overhead storage of boxes above the cubicle work surfaces is a seismic hazard.	Remove boxes stored overhead.

Item #	Bldg	Room	Finding	Action
90-12 *22 Items Total*	90	2002D	Soldering activities/apparatus is being used in this office cubicle.	Proper fire protection is needed for hot soldering work for inside this cubicle. Contact Rob Campbell, EH&S Fire Protection Engineer (x6370).
90-13 *22 Items Total*	90	2002D	Overhead storage of items above the cubicle work surfaces is a seismic hazard.	Remove items stored overhead. (see digital photo)
90-10 *22 Items Total*	90	Kitchen/ Printer Area Outside 2004	An electrical multiple plug outlet that does not comply with PUB 3000 standard was being used and creating an electrical safety hazard.	The non-conforming multiple plug outlet was removed and taken by Tom Caronna, EH&S Electrical Safety Engineer.
90-11 *22 Items Total*	90	Kitchen/ Printer Area Outside 2004	Storage above the sink is not seismically restrained.	Remove items stored overhead above the sink.
90-03 *22 Items Total*	90	2083	The storage of combustible materials (cardboard boxes labeled “Duramax”) outside this cubicle.	Remove boxes to reduce combustible fuel load.
90-09 *22 Items Total*	90	Hallway Outside Rooms 2006 to 2110	Several floor to ceiling bookcases are fully stored with journals and other book without seismic restraints on the shelves. These materials could fall during an earthquake and block egress from the adjacent suite of rooms.	Install seismic restraints on the bookcase shelves.
90-07 *22 Items Total*	90	2086	Overhead storage of books, binders and other items overlap the seismic lip installed to restrain them.	Reposition items stored in overhead shelves to remain behind the seismic restraint lips.
90-06 *22 Items Total*	90	2116	Several boxes stored above the free-standing vertical file cabinets (adjacent to the office entrance/exit) are not seismically secured and may block emergency egress in the event of an earthquake.	Relocate boxes away from egress path; seismically anchor file cabinets to floor by contacting Facilities Department Work Request Center (x6274).
90-04 *22 Items Total*	90	2120	Many books being stored in overhead shelves overlap the seismic lips designed to retrain them.	Reposition books so that they are contained behind the seismic lip of each overhead shelf.

Item #	Bldg	Room	Finding	Action
90-05 *22 Items Total*	90	2120	Several rolls of blueprints are stored on the floor and next to an electrical power strip.	Remove combustible materials away from electrical power strip.
90-02 *22 Items Total*	90	2126	A high voltage electrical safety danger sign "DANGER – High Voltage 12,470 Volts" is displayed on the window.	Remove sign used for decorative purposes.
90-01 *22 Items Total*	90	2135A	There are exposed data lines at the base of an office cubicle partition (Hayworth) facing the public aisle.	Secure data wires with a base plate cover. **DONE**
90-14 *22 Items Total*	90	1078	A couple of freestanding printers are place adjacent to the entry/exit for the suite of rooms.	Seismically secure (Velcro) printers.
90-15 *22 Items Total*	90	1078	Storage on top of wall shelf is a potential seismic hazard.	Rearrange or secure overhead storage items for seismic safety.
90-16 *22 Items Total*	90	1094	Employee is working at the computer workstation in a non-ergonomic manner.	Schedule an ergonomic evaluation by contacting Jeffrey Chung, EH&S, at x5818.
90-19 *22 Items Total*	90	1106	The freestanding magazine rack obstructs access to the adjacent circuit breaker panel. It is also a seismic hazard.	Relocate magazine rack away from electrical panel and seismically anchor.
90-20 *22 Items Total*	90	1106	Electrical cover plates on the carpet are loose and pose a trip and fall hazard.	Tighten screws to eliminate potential trip and fall hazards from the loose plates.
90-21 *22 Items Total*	90	1106	The metal trim enclosing the floor access panels on the carpet are separating and creating a trip and fall hazard.	Repair loose metal trim around the access panels on the carpet.
90-22 *22 Items Total*	90	1114	There are two old "clam shell" office chairs with four casters, which are considered unstable chairs.	Replace these chairs with 5-legged chairs that provide more stability.

Item #	Bldg	Room	Finding	Action
90-17 *22 Items Total*	90	1116	Overhead storage overlaps the seismic lip.	Rearrange storage on the uppermost shelf to assure content is secured behind seismic shelf lip.
90-18 *22 Items Total*	90	1116	There is a freestanding printer on the work counter next to the entryway that could fall and create an egress obstruction during an earthquake.	Seismically secure freestanding office equipment with Velcro.

APPENDIX 2

ESD Activity Hazard Document Listings

APPENDIX 3

ESD Accident Prevention Strategy

APPENDIX 4

ESD Injury and Illness Experience

APPENDIX 5

ESD HEAR Database Summary